REMARKS/ARGUMENTS

Allowance of the above-identified application is respectfully requested in view of the amendments to the claims and the following remarks. This amendment is submitted in order to place the claims in allowable condition, pursuant to discussions with examiner Hope A. Robinson.

Claims 4, 7 and 10 have been cancelled.

Claims 1, 11, 20-23, 26, and 29 have been amended.

Claims 33-34 have been withdrawn.

Claims 1-3, 5-6, 8-9, and 11-32 remain in the case.

No revision of inventorship is necessary in the present application.

Support for the Amendment

Support for the amended claims is found throughout the specification and in the original claims. Specific support is shown below.

Support for inclusion of the term "comprising at least one of the group: saline, phosphate buffered saline (PBS), and non-thermal hysteresis proteins (THP) containing proteinaceous control solutions" in claim 1 is found in previously amended claim 17.

Support for inclusion of the terms "relative" and "defined as the absolute value of the logarithm of the minimum THP dilution required to eliminate RI activity" in amended claim 1 is found in previously amended claims 21, 23, and 25.

Claims 11, 20-23, 26, and 29 have been amended to maintain a consistent usage of the term "relative recrystallization inhibition" throughout the claims.

Invention Summary

Thermal hysteresis proteins (THPs) also known as antifreeze proteins are known to lower the non-equilibrium freezing point of water without lowering the melting point

(equilibrium freezing point). The present invention details relative recrystallization inhibition behavior of thermal hystersis proteins. In particular, extremely dilute solutions of THPs have been shown to inhibit the recrystallization of fine-grained ice samples in a concentration-dependent manner. The high sensitivity of RI to the presence of THPs led Applicants to the present invention, as recited in the amended claims, which is a quantitative assay of THP activity using the recrystallization inhibition behavior. The extent of recrystallization in a fine-grained ice sample is quantified by estimating mean largest cross-sectional area for ice grains in the sample, thus providing the basis for a numerical assessment of RI. A number of different assay characteristics is addressed and described in the specification, including specificity of the RI assay with respect to THP, ice grain size homogeneity within RI ice samples, RI assay sensitivities, applications of the assay, and assay automation.

As defined in currently amended claim 1, the invention particularly defines a relative recrystallization inhibition analysis method for determining the presence, relative concentration, and activity of THPs. A test solution made of a proteinaceous composition in a solvent is flash frozen; the temperature of the frozen solution is raised to an appropriate annealing temperature that allows for a partial melt, while limiting heterogeneity in ice grain sizes within the solution. The frozen solution is maintained at the annealing temperature for a length of time sufficient to allow for ice recrystallization. Changes in ice crystal grain size are monitored over time; and the presence of functional THPs (while reducing the effect of non-specific proteins) in the solution is determined by measuring ice crystal grain sizes relative to a control solution.

Telephone Interview with Examiner Robinson

In a telephone interview with Examiner Robinson on March 23, 2005, Examiner Robinson suggested that the definition of control solution be added to claim 1, and also that the definition of RI factor also be added to claim 1. These changes are made
by this supplementary amendment.

Conclusion

In view of the above remarks and amendment to the claims, Applicants believe they have overcome all rejections. Applicants request allowance of pending claims 1-3, 5-6, 8-9, and 11-32.

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On 4/8/05 (Date of Deposit)

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